

PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON

A MOLLUSCAN FAUNULE FROM
200 METERS OFF VALPARAISO,
CHILE, WITH DESCRIPTIONS
OF FOUR NEW SPECIES

BY HARALD A. REHDER

Smithsonian Institution, Washington, D.C.



During a cruise on the R/V *Anton Bruun* in early 1966, Roger F. Cressey, Jr. and Robert H. Gibbs, Jr. of the Smithsonian Institution, and Bruce B. Collette of the Bureau of Commercial Fisheries, Department of the Interior, spent some days between trips in Valparaiso, Chile. On 12 February they were given the opportunity of going out in a private fishing boat, the M/V *Ruiz*, and doing some trawling off the coast. Two hauls were made, and on one of them, made with a shrimp trawl in 200 meters depth, 17-18 kilometers NW of Valparaiso, six species of mollusks were found in the haul. Because of the interesting nature of this small collection, which included four new species, I have thought it worthwhile to publish this paper. My thanks are due to my three colleagues for taking the trouble to save and preserve the mollusks they found in this haul, and to Walter O. Cernohorsky, now of the Auckland Institute and Museum, Auckland, New Zealand, for preparing the radula slide of the new species of *Aeneator* described below and making the drawings I have used. To Dr. Harold E. Vokes of the Department of Geology, Tulane University, New Orleans, Louisiana and to Mrs. Thomas H. Marshall of Seattle, Washington, I am grateful for allowing me to examine additional lots of *Bathybembix chilensis* n. sp.

LIMOPSIDAE

Limopsis Sassi, 1827Subgenus *Felicia* Mabilie and Rochebrune, 1899***Limopsis (Felicia) ruizana* new species**

Fig. 1

Description: Shell rather large for genus, obliquely and broadly oval, valves rather thick, exterior sculptured with low concentric ridges along the growth lines, covered with a thin brown periostracum from which periostracal bristles originate in radially oriented rows; periostracal bristles rather stiff, not appressed, very dense at margin of shell and projecting somewhat beyond edge. Beaks centrally located, worn, hinge line, measured as the base line of the cardinal area, relatively long, about half the maximum length of the shell, ligament relatively large, in a triangular pit whose base line measures 55 percent of the hinge line. Taxodont hinge teeth rather heavy, numbering 9 posterior to beak and 11 anterior to beak, the third and fourth teeth from anterior end of tooth-row angulate; the third and fourth teeth in from both ends rather large. Interior white, ventral edge thickened, smooth, with the fringed, somewhat matted periostracum extending beyond it. Anterior adductor muscle scar small, close to anterior end of hinge-teeth, with rather strong ridge running from its ventral edge to below hinge plate just below anterior end of posterior row of teeth. An anterior protractor muscle scar is not apparent, but a scar for the posterior protractor muscle seems to be present. In addition there seems to be a small muscle scar on each valve under the beak that may be the place of insertion of elevator muscles (dried muscle fibers are present in these small scars in our specimen).

Holotype: USNM 701671; 17–18 km NW of Valparaiso, Chile, in 200 meters.

Measurements: length 33.18 mm. height 27.2 mm; width (complete shell) 13.57 mm.

Remarks: This species is closest to *Limopsis (Felicia) compressa* Dall, 1896 from the Gulf of Panama, and *L. (F.) marionensis* Smith, 1885 (see Nicol, 1966, pp. 22–25) from the Antarctic and Subantarctic. From the former it differs in the shell being more inflated, heavier, not as elongate, and with coarser, denser and darker periostracal hairs; the hinge line is proportionately longer, and the teeth are more numerous and considerably larger. From *marionensis* Smith it differs in possessing a heavier shell with a proportionately longer hinge line, with the posterior hinge teeth larger, not gradually becoming smaller posteriorly. The periostracal hairs are coarser, denser, and somewhat shorter at the edge of the shell, and not appressed.

The trivial name is based on the name of the private fishing vessel from which the specimens here described were collected.

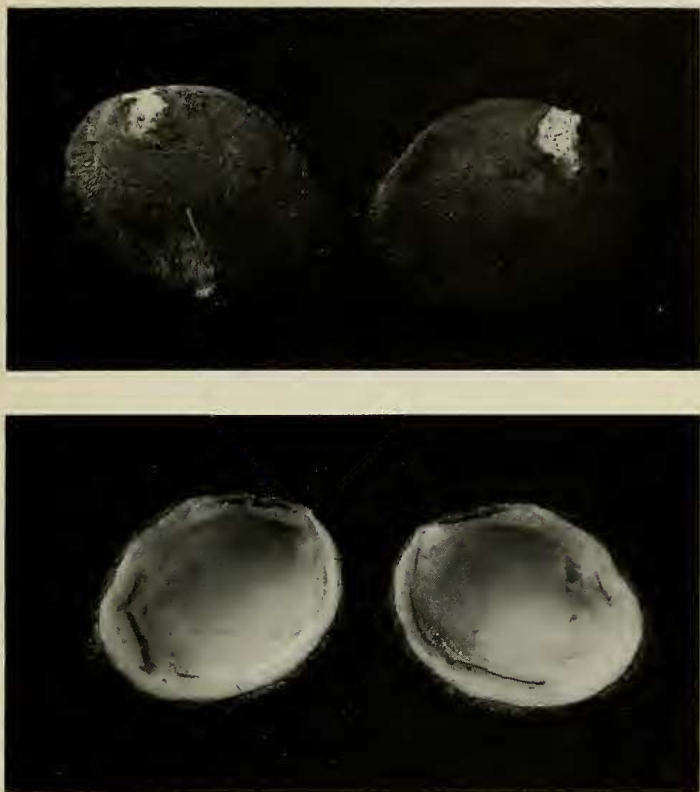


FIG. 1. *Limopsis (Felicia) ruizana*, new species, holotype, $\times 1$.

TROCHIDAE

Bathybembix Crosse, 1893

Bathybembix humboldti new species

Fig. 4

Description: Shell large, thin, trochoid, imperforate, covered with a thin periostracum, that on the body whorl varies from moderate yellowish brown* through moderate to dark olive brown to dark grayish brown, in color, sometimes somewhat darker just below the periphery and lighter towards the base; the penultimate and antepenultimate whorls maybe somewhat lighter.

* Color names here and subsequently from ISCC-NBS Color Names, Kelly and Judd, 1965.

Nuclear whorls missing, as is the case in all observed specimens of this genus, even in juvenile specimens. Postnuclear whorls almost six, the surface of the first $2\frac{1}{2}$ rather eroded, last $3\frac{1}{2}$ whorls covered with a thin periostracum; the early moderately convex whorls show axial ribs which are more prominent below the suture and at the periphery, whorls just below the suture flattened and tabulate and slightly concave between the upper series of axial nodes and those at the periphery; the ribs in this latter area subobsolete, especially in the earliest whorls; at the periphery the ribs are biangulate and vertical so that suture is markedly indented; the last $1\frac{1}{4}$ whorl becomes more concave on the upper part of the whorl, the axial ribs more pronounced, and less angulate at the periphery. The body whorl is strongly convex, with several spiral, finely subnodulose ridges on the lower part of the base. Aperture nearly circular, outer lip thin, simple, expanding in the basal columellar area, interior nacreous, with the axial sculpture showing through. Operculum circular, thin, chitinous, light horn in color, slightly concave, with about six whorls around a central nucleus.

Range: From off northern Peru (95 km S of Islas Lobos de Afuera) south to central Chile (17 km. NW of Valparaiso), in 200 to 735 meters.

Specimens examined: Holotype: USNM 701665, Paratype, USNM 701666, both from 17–18 km NW of Valparaiso, Chile, in 200 meters; four paratypes (USNM 701664) from 28 km SW of Coquimbo, Chile; four paratypes (USNM 701663) and two other paratypes (Colln. Dept. Geology, Tulane Univ.), all from 95 km S ($07^{\circ}49'S$; $80^{\circ}38'W$) of Islas Lobos de Afuera, northern Peru (Anton Bruun Cruise 18B, sta. 754, 5 Sept. 1966).

Measurements (in mm):

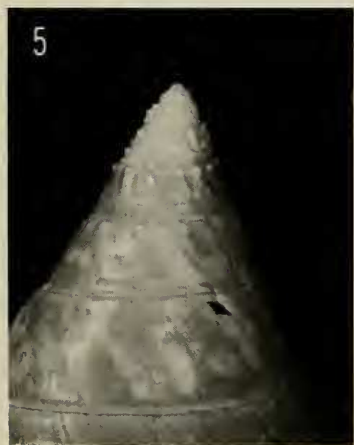
		Height		Width
Holotype	USNM 701665	53.1	44.3	—off Valparaiso, Chile
Paratype*	USNM 701666	55.4	48.1	—off Valparaiso, Chile
Paratype*	USNM 701664	54.1	46.9	—off Coquimbo, Chile

* apical whorls missing

Remarks: *Bathybembix humboldti* is the third species of the genus to be described from the eastern Pacific, and is clearly different from the other two. From *B. bairdii* Dall, 1889, which occurs in 263–685 fms from off the Columbia River to off San Diego, California, (with one lot

→

FIGS. 2–6. 2, *Calliostoma chilena* new species, holotype, $\times 1$; 3, *Calliostoma platinum* Dall, $\times 1$; 4, *Bathybembix humboldti* new species, holotype, $\times 1$; 5, *Calliostoma chilena*, holotype, early whorls, $\times 5$; 6, *Calliostoma platinum* Dall, early whorls, $\times 5$.



from the Bering Sea northwest of Unimak Island, Alaska in 27 fathoms), it differs in having the whorls not as roundly convex, the periostracum darker and in having the axial sculpture more prominent, the spirally oriented sculpture much reduced, especially on the base. *Bathybembix macdonaldi* Dall, 1908, from the Gulf of Panama (546 fms.) and off Manta Ecuador (401 fms.), differs from *humboldti* in being larger and in possessing a single strong nodulose keel at the periphery, giving the whorls a distinctly angulate appearance, and in having the base sculptured with numerous low spiral ridges.

The three populations examined by me are fairly consistent in general shape, size and sculpture.

A statistical table of measurements and mean values was found impractical because of the considerable erosion of the early whorls in most of the specimens, particularly those from south of the Islas Lobos de Afuera. In color, however, these populations differ rather markedly, those from south of Islas Lobos de Afuera being darker with a more greenish cast (moderate to dark olive brown, nos. 95-96 in Kelly and Judd, 1965) than those from off Valparaiso, while the specimens from off Coquimbo are still darker but without a greenish cast (dark grayish brown, no. 62, Kelly and Judd, 1965).

Named for the famous geographer, Alexander von Humboldt, and for the ocean current in whose waters the present collection was made.

Calliostoma Swainson, 1840

***Calliostoma chilena* new species**

Figs. 2, 5

Description: Shell about 36 mm. ($1\frac{3}{8}$ inches) in height, thin, trochoid, imperforate, close to yellowish gray in color.

Nuclear whorls $1\frac{1}{4}$, smooth, convex; postnuclear whorls $8\frac{3}{4}$, first two convex, later ones straight-sided to very slightly convex, the suture almost flush; first postnuclear whorl with three spiral cords, the lowest one the strongest, and the uppermost one, which is situated immediately below the suture, weakest; after the first $\frac{1}{4}$ whorl obscure, axial, prosocline ribs become apparent; these sculptural elements become increasingly stronger in the subsequent whorls with the ribs forming nodes at the intersections with the spiral cords; in the second postnuclear whorl these nodes are largest on the central cord, with the rib elements between the cords becoming gradually weaker, and the part of the whorl between the lowest cord and the suture more strongly concave; in the third postnuclear whorl the nodes on the central and lowermost cord diminish in strength and finally disappear; at the end of the fourth postnuclear whorl the central cord has disappeared, the lowermost cord is a slender ridge, and the uppermost cord has become obscure, connecting a series of low, somewhat elongated subsutural nodes; at the end of the fifth postnuclear whorl all spiral cords

and nodes have disappeared; last postnuclear whorls gently concave at top and bottom, and slightly convex in the middle, and marked with very fine, obscure, irregular spiral striae, particularly on the lower half. Last whorl with a sharp peripheral carina, and with the base strongly sculptured with fine crowded ridges, those near the columellar area broader and flattened.

Aperture subquadrate, columella thickened, slanted 5° from the axis, outer lip rather thin. Operculum, typical, circular, corneous, thin, multi-spiral.

Range: Central Chile, about 17 km. NW of Valparaiso, in 200 meters.

Measurements (in mm):

		Height	Width
Holotype:	USNM 701669	36.1	31.9

Remarks: This species was at first glance identified as *Calliostoma platinum* Dall, 1889 (Figs. 3, 6), found most abundantly off Southern California but occurring as far north as the Farallon Islands, and the presence of this species in a locality 3900 miles to the south was considered most unusual. This led to a more critical examination of the shells, and differences in the sculpture of the early postnuclear whorls and in other minor characters were revealed.

The spire in *C. chilena* (Fig. 5) appears to be more slender (spire angle 65° as opposed to 70° in *platinum*), the whorls less convex, and the sculpture of the early postnuclear whorls stronger. In *C. platinum* (Fig. 6) the axial sculpture is reduced and all sculpture disappears one whorl earlier. The sculpture of the base is not as pronounced, with much of the sculpture consisting of incised lines rather than raised striae or cords.

The allocation of this species to one of the subgenera of *Calliostoma* must await an examination of the radula.

CYMATIIDAE

Fusitriton Cossmann, 1903

Fusitriton cancellatum Lamarck, 1816

Two specimens, 70.9 mm and 69.4 mm in height, (USNM 701670) were dredged at this locality, which is near the northern limit of this species. The northernmost locality known for this basically Magellanic species is recorded by J. T. Smith (1970, pp. 478-479) who cites a large number of specimens, taken by the *Anton Bruun* on Cruise 18A in 580 meters off Punta Pichicui, Chile (sta. 702: $32^{\circ} 17'S$, $71^{\circ} 40'W$); this locality is about 83 km. north of Valparaiso. The Valparaiso specimens resemble these specimens from Tictoc Bay in that they are relatively smaller than those found farther south.

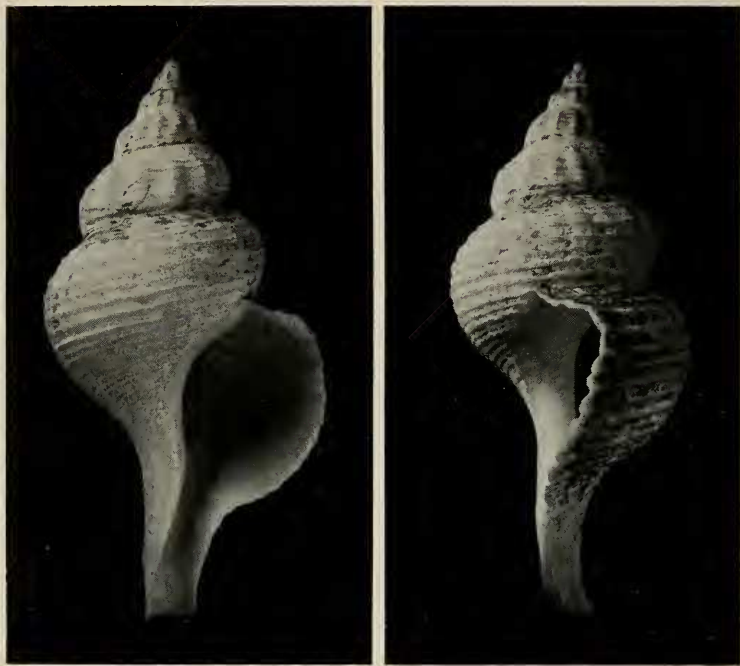


FIG. 7. *Aeneator (Ellicea) loisae*, new species, holotype, $\times 1$.

BUCCINULIDAE

Aeneator Finlay, 1927

Subgenus *Ellicea* Finlay, 1928

The relationship of *Ellicea* to *Aeneator* has been discussed by Powell (1929: 91) and Dell (1956: 97–98, and 1963: 210). The presence of a member of this hitherto strictly Neozelanic group in Chilean waters is of great interest, and is further evidence of the close connection of the southernmost American faunas (Magellanic, Peruvian, and Argentinian) with those of the Neozelanic provinces.

Powell (l. c.) has stressed the closer resemblance of the radula of *Aeneator* to that of the *Buccinulum* than to the radula of *Penion* (as *Austrosipho*) but the figures that Dell gives for the radulae of species of *Aeneator* and *Aeneator (Ellicea)* (Dell, 1956: pl. B, figs. 8–10) show a quadrangular base to the rachidian, resembling more that of *Penion*. The radula of the new Chilean species (Fig. 8A) is close in appearance to that of *Penion dilatata* (Q. & G.) (Powell, l. c., Fig. 122) as well as to that of *Aeneator (Ellicea) recens* Dell (Dell l. c., pl. B, fig. 9).

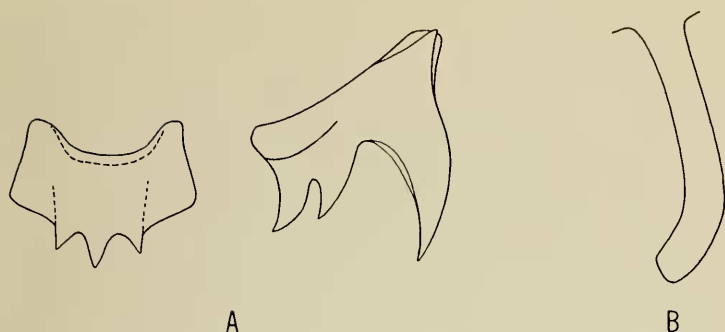


FIG. 8. *Aeneator (Ellicea) loisae* new species: A. Radula: rhachidian and lateral; B. Penis.

***Aeneator (Ellicea) loisae* new species**

Figs. 7,8

Description: Shell moderately large for genus, somewhat elongate-fusiform, chalky yellowish white in color, covered with a thin light straw-colored periostracum. Nuclear whorls missing; remaining whorls number about six. Early whorls moderately convex, obscurely angulate at periphery (a character that disappears in the later whorls), marked by strong axial, rather distant, retractively curved ribs which are crossed by fine equidistant spiral cords; these ribs, which number 14 on the antepenultimate whorl, gradually diminish in strength until they disappear completely on the last $\frac{1}{8}$ of the penultimate whorl; penultimate whorl rather convex, with eleven spiral cords, the first three, below the suture, finer and crowded, the others equidistant. Last whorl convex, the spiral cords below the first three finer subsutural cords may have one or two finer threads in the interspaces; below the periphery the spiral cords become somewhat more crowded. Anterior canal rather long, somewhat bent, open, parietal and columellar area with a sharply delimited, thin, shiny glaze. Aperture elongate ovate, outer lip reflexed, somewhat thickened, scalloped, with a broad sinus above the periphery, the upper edge strongly retracted, the lower and longer edge curving forward at a right angle into the broadly arcuate portion of the lower part of the outer lip.

The radula ribbon, is about 9 mm long and 0.5 mm wide, with 97 rows of mature teeth and 7 rows of immature teeth. Most of the ribbon is white with rows 73–97 brownish.

The penis in the preserved state is creamy white and about 30 mm long.

Measurements: Holotype: USNM 701667; height: 74.7 mm; width 37.3 mm, length of spire 34.4 mm.

Remarks: Because of the similarity of the radula of this species (fig. 8A) to those of *Aeneator*, *Aeneator (Ellicea)*, and the related genus

Penion, and the close resemblance of the shell of our new Chilean species to that of *A. (Ellicea) benthiculus* Dell (1963, p. 210, pl. 1, figs. 5-6), found in 200-340 fathoms off the northeastern coast of North Island, New Zealand, I am considering this species to belong to the New Zealand group *Aeneator (Ellicea)*. The occurrence of this genus on the other side of the South Pacific Ocean from New Zealand, an extension of range amounting to about 5,000 miles, is of great interest not because it is wholly unexpected or novel but because it adds another group to those genera and groups of species of mollusks that show similar patterns of distribution. An example of this pattern is *Argobuccinum ranelliforme* (King, 1832) from southern Chile, and *A. tumidum* (Dunker, 1862) from New Zealand.

Our species differs from its closest relative *A. (E.) benthiculus* Dell in being larger, with a relatively wider and more inflated body whorl, with more prominent axial ribs on the spire, and a slightly deeper sinus on the outer lip. From the other living species, *A. (E.) recens* Dell, 1951 (Dell, 1956, p. 101, fig. 142), it differs in possessing weaker, less angulate, axial ribs on the spire and body whorl. The earliest whorls of the specimen of *A. (E.) loisae* are missing but from the nature of the remaining early whorls the protoconch appears to have been paucispiral and somewhat elevated, differing in this respect from the protoconch of specimens of *A. (E.) benthiculus* which is low, broad, and which numbers $2\frac{1}{2}$ whorls. More perfect material of the new species is needed before the possible importance of this character can be assessed.

This species is named for my wife.

VOLUTIDAE

Miomelon Dall, 1907

Miomelon philippiana (Dall, 1890)

A specimen of this relatively rare species, measuring 50.1 mm in length (USNM 701668) was found at this locality, which is almost midway between the type locality—north of Isla Mocha, Arauco Province, Chile—and the only other previously recorded locality for this species—off Coquimbo, Chile (Weaver, 1964, p. 8).

LITERATURE CITED

- DALL, W. H. 1889. Reports on the results of dredging- - -U. S. Coast Survey Steamer "Blake"- - -. xxxix. Report on the Mollusca. Part 2, Gastropoda and Scaphopoda. Bull. Mus. Comp. Zool. Harvard Coll., vol. 18, pp. 1-492, pls. 10-40.
- . 1890. Scientific results of explorations by the U.S. Fish Commission steamer "Albatross." VII. Preliminary report on the collection of Mollusca and Brachiopoda obtained in 1887-88. Proc. U.S. Nat. Mus., vol. 12, no. 773, pp. 219-362, pls. 5-14.

- . 1896. Diagnoses of new species of mollusks from the west coast of America. Proc. U.S. Nat. Mus., vol. 18, no. 1034, pp. 7-20.
- . 1908. Reports on the dredging operations- - -U.S. Fish Commission steamer "Albatross" during 1891- - -. xxxvii. Reports on the scientific results of the expedition to the eastern tropical Pacific- - -October, 1904 to March, 1905 - - -. XIV. The Mollusca and Brachiopoda. Bull. Mus. Comp. Zool. Harvard Coll., vol. 43, no. 6, pp. 205-487, pls. 1-22.
- DELL, R. K. 1956. The archibenthal Mollusca of New Zealand. Dominion Museum Bull. no. 18, pp. 1-235, pl. 1-24 [+2], 6 text figs.
- . 1963. Archibenthal Mollusca from northern New Zealand. Trans. Royal Soc. New Zealand, Zoology, vol. 3, no. 20, pp. 205-216, pl. 1, 4 text figs.
- KELLY, K. L. AND D. B. JUDD. 1965. The ISCC-NBS method of designating colors and a dictionary of color names. Nat. Bur. Standards Circular 553 (reprinted), V + 158 pp. ISCC-NBS color name charts illustrated with centroid colors (Suppl. to NBS Circ. 553).
- NICOL, D. 1966. Descriptions, ecology, and geographic distribution of some Antarctic pelecypods. Bull. American Paleontology, vol. 51, no. 231, pp. 1-102, pl. 1-9.
- POWELL, A. W. B. 1929. The Recent and Tertiary species of the genus *Buccinulum* in New Zealand, with a review of related genera and families. Trans. New Zealand Institute, vol. 60, pp. 57-101, 132 figures, including 4 pls.
- SMITH, J. T. 1970. Taxonomy, distribution, and phylogeny of the cymatiid gastropods *Argobuccinum*, *Fusitriton*, *Mediargo*, and *Priene*. Bull. American Paleontology, vol. 56, no. 254, pp. 443-573, pls. 39-49.
- WEAVER, C. S. 1964. 2nd provisional species list of living Volutidae. Honolulu, [1] + 10 pp.